

CLAIMS

What is claimed is:

1. A transmitter for processing signals in accordance with two or more access protocols, comprising:

a first digital waveform generator to generate a plurality of first digital waveforms from first transmission data in accordance with a first access protocol;

a second digital waveform generator to generate a plurality of second digital waveforms from second transmission data in accordance with a second access protocol;

one or more common reconstruction filters coupled to both the first and second digital waveform generators to receive one of the first and second digital waveforms and output one or more analog waveforms.

2. The transmitter of claim 1, wherein first access protocol is one of Advanced Mobile Telephone System (AMPS), Digital Advanced Mobile Telephone System (DAMPS), Global System for Mobile communication (GSM), and Enhanced Data for GSM Evolution (EDGE), and

wherein the second access protocol is another one of AMPS, DAMPS, GSM, and EDGE.

3. The transmitter of claim 1, wherein the first waveform generator comprises:  
a plurality of first  $\Sigma$ - $\Delta$  converters to produce the plurality of first digital waveforms from first interpolated data, and

wherein the second waveform generator comprises:

a plurality of second  $\Sigma$ - $\Delta$  converters to produce the plurality of second digital waveforms from second interpolated data.

4. The transmitter of claim 3, further comprising:

a switch to connect one of the first and second digital waveform generators to the one or more common reconstruction filters.

5. The transmitter of claim 3, further comprising:

a memory device to store first and second look-up tables containing data in accordance with the first and second access protocols,

wherein the first digital waveform generator comprises the first look-up table, which maps the first transmission data to the first interpolated data, and

wherein the second digital waveform generator comprises the second look-up table, which maps the second transmission data to the second interpolated data.

6. The transmitter of claim 3, wherein the first digital waveform generator comprises:

a first interpolator to interpolate and increase a first sampling rate of data input thereto and to output the first interpolated data to the plurality of first  $\Sigma$ - $\Delta$  converters, and

wherein the second digital waveform generator comprises:

a second interpolator to interpolate and increase a second sampling rate of data input thereto and to output the second interpolated data to the plurality of second  $\Sigma$ - $\Delta$  converters.

7. The transmitter of claim 6, wherein the first digital waveform generator comprises:

a first upsampling device to receive and over-sample the first transmission data to output first over-sampled data at the first sampling rate to the first interpolator.

8. The transmitter of claim 7, wherein the second digital waveform generator comprises:

a second upsampling device to receive and over-sample the second transmission data to output second over-sampled data at the second sampling rate to the second interpolator.

9. The transmitter of claim 1, wherein the one or more common reconstruction filters comprise low-pass filters with a bandwidth of 200 kHz or more.

10. The transmitter of claim 9, wherein the one or more common reconstruction filters comprise two low-pass filters with a common bandwidth.

11. A method for filtering signals in a transmitter comprising one or more common reconstruction filters for two or more access protocols, the method comprising:

generating a plurality of first waveforms from first transmission data in accordance with a first access protocol;

generating a plurality of second waveforms from second transmission data in accordance with a second access protocol; and

filtering, by the one or more common reconstruction filters, one of the first and second waveforms to produce an analog waveform.

12. The method of claim 11, wherein first access protocol is one of Advanced Mobile Telephone System (AMPS), Digital Advanced Mobile Telephone System (DAMPS), Global System for Mobile communication (GSM), and Enhanced Data for GSM Evolution (EDGE), and

wherein the second access protocol is another one of AMPS, DAMPS, GSM, and EDGE.

13. The method of claim 11, further comprising:  
selectively connecting one of the plurality of first digital waveforms and the plurality of second digital waveforms at a time to the one or more common reconstruction filters.

14. The method of claim 11, wherein generating the plurality of first waveforms from first transmission data in accordance with a first access protocol comprises:

reading values from a first look-up table based on the first transmission data,  
and

wherein generating the plurality of second waveforms comprises:  
reading values from a second look-up table based on the second transmission data.

15. The method of claim 11, wherein generating the plurality of first waveforms from first transmission data in accordance with a first access protocol comprises:

over-sampling the first transmission data at a multiple of its symbol rate, the multiple being based on the first access protocol, to output first over-sampled data;

interpolating the first over-sampled data at another multiple of its sampling rate, the another multiple being based on the first access protocol, to output first interpolated data; and

converting the first interpolated data to the first waveforms.

16. The method of claim 15, wherein generating the plurality of first waveforms from first transmission data in accordance with a first access protocol further comprises:

filtering the first over-sampled data to restrict its bandwidth.

17. The method of claim 15, wherein generating the plurality of second waveforms comprises:

over-sampling the second transmission data at a multiple of its symbol rate, the multiple being based on the second access protocol, to output second over-sampled data;

interpolating the second over-sampled data at a multiple of its sampling rate, the multiple being based on the second access protocol, to output second interpolated data; and

converting the second interpolated data to the second waveforms.

18. The method of claim 15, wherein generating the plurality of second waveforms from second transmission data in accordance with a second access protocol comprises:

interpolating the second transmission data at a multiple of its sampling rate, the multiple being based on the second access protocol, to output second interpolated data; and

converting the second interpolated data to the second waveforms.

19. The method of claim 11, wherein said filtering one of the first and second waveforms to produce an analog waveform comprises:

filtering, by one or more low-pass filters with a bandwidth of 200 kHz or more, one of the first and second waveforms.

20. A transmitter in a mobile terminal, comprising:

a plurality of waveform generators, each waveform generator generating a waveform from transmission data according to a different access protocol; and

a common reconstruction filter coupled to each of the plurality of waveform generators to receive a waveform from one of the plurality of waveform generators and to filter the received waveform.

21. The transmitter of claim 20, wherein the common reconstruction filter comprises:

a passive low pass filter with a bandwidth of 500 kHz or more.

22. The transmitter of claim 20, wherein the common reconstruction filter comprises:

an active low pass filter with a bandwidth of 500 kHz or more.